

What is claimed is:

1. A manufacturing method for an optical fiber grating, comprising:

5 a grating creation step of creating grating sections, having a structure in which the refractive index periodically changes along the longitudinal direction of an optical fiber, in said optical fiber, sandwiching a phase adjustment section with changing the period of said refractive index change from one another; and

10 a phase adjustment step of adjusting the optical length of said phase adjustment section while monitoring the spectrum of the reflectance of the optical fiber grating where said grating sections and said phase adjustment sections are disposed.

15 2. The manufacturing method for an optical fiber grating according to Claim 1, wherein

said optical fiber is an optical fiber comprising a core and a clad which is disposed around said core, where at least one of said core and said clad is made of a material of
20 which the refractive index is increased by irradiating a first light, and

said grating creation step is a step of changing the refractive index at said period along the longitudinal direction of said optical fiber by irradiating the first light
25 at said period along the longitudinal direction of said optical fiber.

3. The manufacturing method for an optical fiber grating according to Claim 1, wherein said optical fiber is comprised of a core and a clad which is disposed around said core, wherein at least one of said core and said clad is made of a material of which the refractive index is increased by irradiating a second light, and said phase adjustment step is a step of irradiating said second light only on said phase adjustment section so as to change the refractive index.

4. The manufacturing method for an optical fiber grating according to Claim 3, wherein said phase adjustment step is a step of allowing a third light to enter the core of said optical fiber, and allowing the reflected light, which is reflected from the grating section of said optical fiber, to enter a light intensity measuring instrument, and while observing the spectrum of said reflected light by said light intensity measuring instrument, ending the irradiation of said second light at the point when the minimum value of the spectrum of said reflected light between the adjacent main lobes becomes the smallest.

5. The manufacturing method for an optical fiber grating according to Claim 4, wherein said third light is entered to the core of said optical fiber through an optical circulator, and said reflected light is entered to the light intensity measuring instrument again through said optical circulator.

6. The manufacturing method for an optical fiber grating according to Claim 1, wherein the grating sections are created such that the amount of change of the refractive index of said

grating sections becomes smaller when approaching closer to both ends of said grating section.

7. The manufacturing method for an optical fiber grating according to Claim 6, wherein said optical fiber is comprised of a core and a clad disposed around said core, and at least one of said core and said clad is made of a material of which the refractive index is increased by irradiation of the first light.

8. The manufacturing method for an optical fiber grating according to Claim 7, wherein said grating creation step further comprising a step of overlaying said phase grating and a transmittance distribution mask which has cosine function type characteristics where the transmittance of said first light becomes smallest at the center area of said grating section and becomes the highest at both ends of said grating section, and exposing using these as a mask, or a step of exposing using said phase grating as a mask, then continuously exposing using said transmittance distribution mask as a mask.

9. The manufacturing method for an optical fiber grating according to Claim 2, wherein the first light is an ultraviolet light with a wavelength which generates a light induced refractive index change phenomena.

10. The manufacturing method for an optical fiber grating according to Claim 7, wherein the first light is an ultraviolet light with a wavelength which generates a light induced refractive index change phenomena.

11. The manufacturing method for an optical fiber grating according to Claim 8, wherein the first light is an ultraviolet light with a wavelength which generates a light induced refractive index change phenomena.

5 12. The manufacturing method for an optical fiber grating according to Claim 3, wherein the second light is an ultraviolet light with a wavelength which generates a light induced refractive index change phenomena.

10 13. The manufacturing method for an optical fiber grating according to Claim 4, wherein the second light is an ultraviolet light with a wavelength which generates a light induced refractive index change phenomena.

15 14. The manufacturing method for an optical fiber grating according to Claim 4, wherein the third light is a light of which the wavelength is the same as the wavelength of the light carrier wave.

20 15. The manufacturing method for an optical fiber grating according to Claim 5, wherein the third light is a light of which the wavelength is the same as the wavelength of the light carrier wave.

16. An optical fiber grating to be manufactured by the manufacturing method for an optical fiber grating according to Claim 1.